WHAT IS CLAIMED IS:

1. A method of manufacturing an electronic device comprising an underlying layer, an etching stopper film of an insulator provided on said underlying layer, an interlayer dielectric film provided on said etching stopper film, a lower wiring buried in an upper main surface of said underlying layer, an upper wiring buried in an upper main surface of said interlayer dielectric film, and a contact section for electrically connecting said lower wiring to said upper wiring, the method comprising the steps of:

(a) selectively removing said interlayer dielectric film and forming a hole penetrating through said interlayer dielectric film to reach said etching stopper film;

(b) carrying out a heat treatment with said hole opened;

(c) filling said hole with an organic resin which can be cured by a deep ultraviolet light and curing said organic resin with said deep ultraviolet light to form a buried plug;

(d) selectively removing said interlayer dielectric film and said buried plug by using a chemically amplified resist as an etching mask and forming a trench pattern for burying said upper wiring in said upper main surface of said interlayer dielectric film;

(e) removing said buried plug remaining in said hole to obtain a structure in which said trench pattern communicates with said hole;

(f) selectively removing said etching stopper film to expose said lower wiring; and

(g) filling said trench pattern and said hole with a conductor material to simultaneously form said upper wiring and said contact section.

2. The method of manufacturing an electronic device according to claim 1, wherein said interlayer dielectric film is a dielectric film containing silicon, oxygen,

carbon and hydrogen and having a relative dielectric constant of 3.0 or less including a siloxane bonding as a main structure.

3. The method of manufacturing an electronic device according to claim 2, wherein said interlayer dielectric film is a methylsilsesquioxane film or an SiOC film.

4. The method of manufacturing an electronic device according to claim 1, wherein said electronic device further comprises an upper protective film provided on said upper main surface of said interlayer dielectric film, and

said step (a) includes a step of forming said hole to penetrate through said upper protective film.

5. The method of manufacturing an electronic device according to claim 4, further comprising a step of forming an anti-reflection coating over said upper protective film and said buried plug between said steps (c) and (d),

said step (d) including a step of selectively removing said anti-reflection coating to form said trench pattern.

6. The method of manufacturing an electronic device according to claim 1, wherein said electronic device further comprises an etching stopper film for forming said trench pattern to define a depth of said trench pattern in said interlayer dielectric film,

said step (a) includes a step of forming said hole to penetrate through said etching stopper film for forming said trench pattern, and

said step (d) includes a step of setting an etching condition to stop etching at said etching stopper film for forming said trench pattern.

7. The method of manufacturing an electronic device according to claim 1, further comprising a step of carrying out a hydrophobic treatment using a silane coupling material between said steps (b) and (c).

8. The method of manufacturing an electronic device according to claim 1, wherein said interlayer dielectric film has a two-layer structure including a silicon oxide film provided on a lower layer side, and

a dielectric film containing silicon, oxygen, carbon and hydrogen and having a relative dielectric constant of 3.0 or less including a siloxane bonding as a main structure which is provided on an upper layer side, and

said dielectric film has a thickness which is equivalent to a depth of said trench pattern.

9. The method of manufacturing an electronic device according to claim 1, wherein said etching stopper film has a two-layer structure including a first film provided on a lower layer side, and

a second film provided on an upper layer side and having a lower dielectric constant than that of said first film.

10. A method of manufacturing an electronic device comprising an underlying layer, an etching stopper film of an insulator provided on said underlying layer, an interlayer dielectric film provided on said etching stopper film, a lower wiring buried in an upper main surface of said underlying layer, an upper wiring buried in an upper main surface of said interlayer dielectric film, and a contact section for electrically connecting said lower wiring to said upper wiring, the method comprising the steps of:

(a) selectively removing said interlayer dielectric film and forming a hole penetrating through said interlayer dielectric film to reach said etching stopper film;

(b) carrying out a heat treatment with said hole opened;

(c) filling said hole with an SOG material and carrying out a heat treatment at 50 to 200℃ to crosslink said SOG material, thereby forming a buried plug in said hole;

(d) selectively removing said interlayer dielectric film and said buried plug by using a chemically amplified resist as an etching mask and forming a trench pattern for burying said upper wiring in said upper main surface of said interlayer dielectric film;

(e) removing said buried plug remaining in said hole to obtain a structure in which said trench pattern communicates with said hole;

(f) selectively removing said etching stopper film to expose said lower wiring; and

(g) filling said trench pattern and said hole with a conductor material to simultaneously form said upper wiring and said contact section.

11. The method of manufacturing an electronic device according to claim 10, wherein said interlayer dielectric film is a dielectric film containing silicon, oxygen, carbon and hydrogen and having a relative dielectric constant of 3.0 or less including a siloxane bonding as a main structure.

12. The method of manufacturing an electronic device according to claim 11, wherein said interlayer dielectric film is a methylsilsesquioxane film or an SiOC film.

13. The method of manufacturing an electronic device according to claim 10, wherein said step (c) includes a step of filling said hole with hydrogen silsesquioxane.

14. The method of manufacturing an electronic device according to claim 13, wherein said step (c) includes a step of carrying out a heat treatment for 10 minutes or less.

15. The method of manufacturing an electronic device according to claim 10, wherein said electronic device further comprises an upper protective film provided on said upper main surface of said interlayer dielectric film, and

said step (a) includes a step of forming said hole to penetrate through said upper protective film.

16. The method of manufacturing an electronic device according to claim 15, further comprising a step of forming an anti-reflection coating over said upper protective film and said buried plug between said steps (c) and (d),

said step (d) including a step of selectively removing said anti-reflection coating to form said trench pattern.

17. The method of manufacturing an electronic device according to claim 10, wherein said electronic device further comprises an etching stopper film for forming said trench pattern to define a depth of said trench pattern in said interlayer dielectric film,

said step (a) includes a step of forming said hole to penetrate through said etching stopper film for forming said trench pattern, and

said step (d) includes a step of setting an etching condition to stop etching at said etching stopper film for forming said trench pattern.

18. The method of manufacturing an electronic device according to claim 10,

further comprising a step of carrying out a hydrophobic treatment using a silane coupling material between said steps (b) and (c).

19. The method of manufacturing an electronic device according to claim 10, wherein said interlayer dielectric film has a two-layer structure including a silicon oxide film provided on a lower layer side, and

a dielectric film containing silicon, oxygen, carbon and hydrogen and having a relative dielectric constant of 3.0 or less including a siloxane bonding as a main structure which is provided on an upper layer side, and

said dielectric film has a thickness which is equivalent to a depth of said trench pattern.

20. The method of manufacturing an electronic device according to claim 10, wherein said etching stopper film has a two-layer structure including a first film provided on a lower layer side, and

a second film provided on an upper layer side and having a lower dielectric constant than that of said first film.